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(54) Modular lighting elements with leds (light-emitting diodes)

(57) The invention concerns new modular lighting elements (M) comprising a printed circuit (B), at least one male connector (Cm) and at least one female connector (Cf), series of LEDs (light-emitting diodes) (L) connected in series in groups and integrated circuits (I) for the adjustment of the current supplied to the LEDs; the connectors (Cf, Cm) are electrically and directly connected to each other and said connection lines (La, Lb)

for the connectors supplies power to one or more microchips that in turn supplies/supply power to a series of LEDs.

The printed circuit (B) may have any shape, for example it may be linear, rectangular, angular, T-shaped, arc-shaped, square, circular or polyhedral, regular or irregular. It is possible to carry out a modular lighting system comprising one or more lighting elements (M).

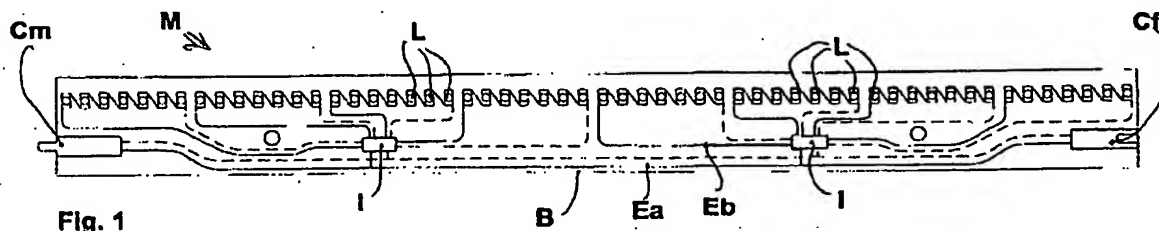


Fig. 1

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by combining several modular elements it is possible to increase the quantity of light emitted and diffused, as well as the distribution of the light sources on a larger area.

[0019] In the system proposed every series of LEDs should be controlled by a microchip and this requires and guarantees the perfect knowledge of the current passing through each LED, thus ensuring uniformity, long life and maximum results in terms of illumination engineering, at the same time avoiding voltage variations in the measure allowed by the components employed. Furthermore, thanks to this control system, there is no need to provide power supplies whose size must be proportioned to the number of LEDs that will probably be employed, or, vice versa, to limit the number of LEDs according to the size of the power supply: since the microchip has full control of the LED power supply, the printed circuit ensures an ample margin for the characteristics of the power supply, and therefore it is possible to provide an oversize power supply in view of larger future applications.

[0020] The possibility to have an oversize power supply is the basis of the idea proposing a quick system for the electrical connection of the printed circuits, since it is always the microchip that provides for the LED power supply, independently of what happens before.

[0021] Therefore, it is immediately possible to increase or decrease the number of printed circuits with no need to operate on the power supply unit, with obvious advantages in terms of rapidity in the modification of the system configuration. The number of printed circuits that can be connected in cascade is unlimited, since it depends exclusively on the dimensions of the tracks and of the power supply, with no negative implication if the involved quantity is excessive.

[0022] The following is just an example among many of a practical embodiment of the invention in question, illustrated in the attached drawings, wherein:

Figure 1 shows in detail a modular lighting element (M), comprising in its main parts a printed circuit (B), a male connector (Cm) and a female connector (Cf) connected to each other by means of conduction lines La and Lb, series of LEDs (L) connected in series in groups and integrated circuits (I) for the adjustment of the current supplied to the LEDs (L). Figures 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h, 2i, 2j, 2m, 2n show some possible embodiments of the modular lighting element, suitable for obtaining lighting devices having the desired shapes.

[0023] Therefore, with reference to the above specifications and the attached drawings, the following claims are put forth.

Claims

1. Modular lighting elements, **characterized in that** they comprise a printed circuit, at least one male connector and at least one female connector, series of LEDs (light-emitting diodes) connected in series in groups and integrated circuits for the adjustment of the current supplied to the LEDs, and wherein the connectors are electrically and directly connected to each other, and wherein said connection line for the connectors supplies power to one or more microchips that in turn supplies/supply power to a series of LEDs.
2. Modular lighting elements according to claim 1, **characterized in that** the printed circuit may have any shape, for example it may be linear, rectangular, angular, T-shaped, arc-shaped, square, circular or polyhedral, regular or irregular.
3. Modular lighting system **characterized in that** it comprises one or more lighting elements produced according to claim 1 and 2.

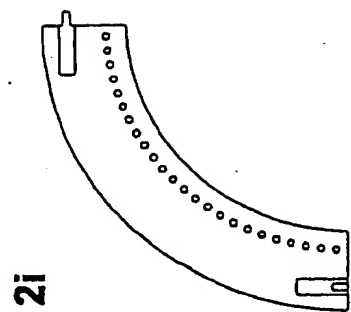


Fig. 2i

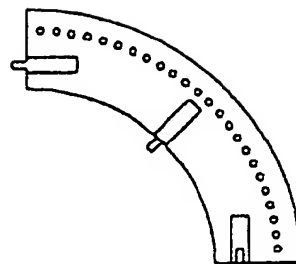


Fig. 2l

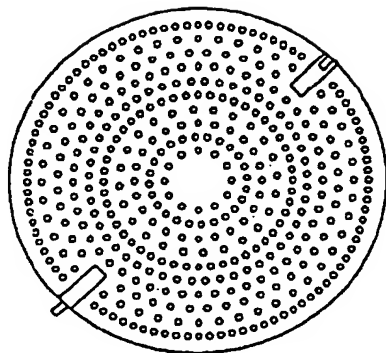


Fig. 2m

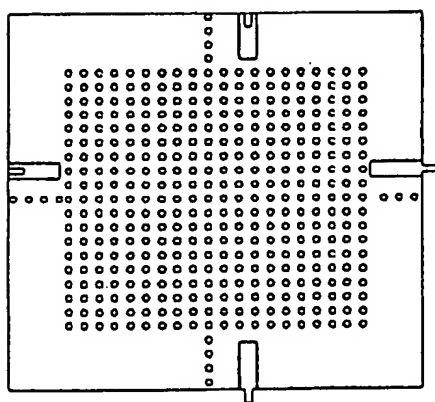


Fig. 2g

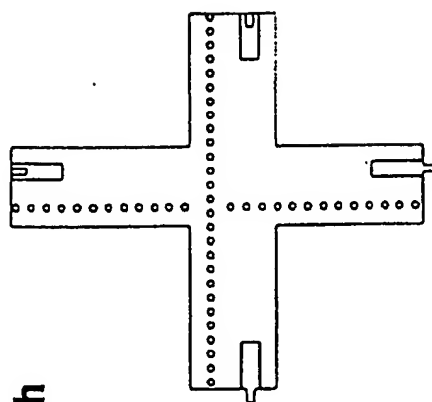


Fig. 2h